CLAIMS

Sub A1

1. A process for the manufacture of a part with very high mechanical properties, formed by stamping of a strip of rolled steel sheet and more particularly hot rolled and coated with a metal or metal alloy ensuring protection of the surface and the steel, whereby :

- the steel sheet is cut to obtain a steel sheet blank,
- the steel sheet blank is stamped to obtain the part,
- an alloyed intermetallic compound is applied to the surface, before or after the stamping, ensuring protection against corrosion, against steel decarburization, which intermetallic compound may provide a lubrication function,
- the excess material from the steel sheet required for the stamping operation is trimmed.

2. A process according to Claim 1 wherein:

- the steel sheet is cut to obtain a steel sheet blank,
- the coated steel sheet blank is subjected to a rise in temperature in order to hot-form a part,
- an alloyed intermetallic compound is thereby formed at the surface of the part, ensuring protection against corrosion, against steel decarburization, which intermetallic compound may provide a lubrication function,
- the steel sheet blank is fabricated by stamping
- the stamped part is cooled to obtain such mechanical properties in the steel as high hardness and high surface hardness of the coating,
- the excess material from the steel sheet required for the stamping operation is trimmed.

3. A process according to Claim 1 wherein the metal or metal alloy for the coating is zinc or a zinc-based alloy of a thickness ranging from 5 μm to 30 μm.

Sub A2

4. A process according to Claim 1 wherein the intermetallic alloy is a zinc-iron or zinc-iron-aluminum based compound.

5. A process according to Claim 1 wherein the coated steel sheet is subjected to a rise in temperature in excess of 700°C prior to the stamping and/or heat treatment.

6. A process according to Claim 1 wherein the part obtained in particular by stamping is cooled so that it is quenched at a rate higher than the critical cooling rate.

7. Use of a strip of rolled steel sheet and more particularly hot rolled and coated with a metal or metal alloy ensuring protection of the surface and the steel of the steel sheet in the forming by stamping, in particular hot forming of parts, such parts having high mechanical properties as regards hardness and high surface hardness as well as very good resistance to abrasion.